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Indian Standard
**SPECIFICATION FOR
FIRECLAY NOZZLES**

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR

FIRECLAY NOZZLES

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(Continued on page 5)

Indian Standard
**SPECIFICATION FOR
 FIRECLAY NOZZLES**

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 30 April 1968, after the draft finalized by the Refractories Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 The perfect nozzle is defined to permit teeming of entire cast of metal at a constant rate without splashing on the sides of ingot mould and without contaminating the metal. The nozzle should also maintain a perfect seating for the stopper head so that no dribbling occurs while the ladle is being removed from one mould to the other.

0.2.1 In view of the fact that bloating type of fireclay is not available in the country, only refractory nozzles have been covered in this specification.

0.3 This standard keeps in view the manufacturing and trade practices followed in the country in this field.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the requirements for fireclay nozzles for use in ladles of capacity up to 100 tonnes.

2. SUPPLY OF MATERIAL

2.1 General requirements relating to the supply of fireclay nozzles shall be as laid down in IS : 1387-1967†.

*Rules for rounding off numerical values (*revised*).

†General requirements for the supply of metallurgical materials (*first revision*).

2.2 The refractories shall be compact, of homogeneous texture and free from cracks, voids and other flaws. They shall be burnt evenly throughout, shall have no soft corners and shall have sufficient mechanical strength. The contour of the place where the stopper head will sit, shall be checked by a template to find out whether the proper contour according to the drawing has been maintained.

3. SAMPLING

3.1 Representative samples shall be drawn according to the scheme of sampling given in IS : 1528-1962* for carrying out tests specified in this standard.

4. TOLERANCE ON SIZE

4.1 Variation from specified dimensions covering both warpage and shrinkage shall be allowed to the extent of ± 1 percent or ± 1 mm whichever is greater.

5. PYROMETRIC CONE EQUIVALENT (SOFTENING POINT)

5.1 When determined in accordance with the method given in IS : 1528-1962*, the refractories shall have a pyrometric cone equivalent (PCE) of not less than Standard Pyrometric Cone (ASTM) No. 28.

6. APPARENT POROSITY

6.1 When tested in accordance with the methods given in IS : 1528-1962*, the apparent porosity of the refractories shall be not more than 25 percent by volume.

7. PERMANENT LINEAR CHANGE AFTER REHEATING

7.1 When the refractories are uniformly heated to 1400°C according to the schedule specified in IS : 1528-1962*, maintained at that temperature, within a variation of $\pm 20^\circ\text{C}$ for 5 hours and slowly cooled, they shall show a variation of not more than 0·5 percent of the original length.

8. MARKING

8.1 Each refractory brick or shape shall be clearly marked with the manufacturer's name or trade-mark.

*Methods of sampling and physical tests for refractory materials.

8.1.1 The brick or shape may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act, and the Rules and Regulations made thereunder. Presence of this mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard, under a well-defined system of inspection, testing and quality control during production. This system, which is devised and supervised by ISI and operated by the producer, has the further safeguard that the products as actually marketed are continuously checked by ISI for conformity to the standard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

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